

In the Claims:

CLAIMS 1-28 (Cancel)

CLAIM 29 (Previously Presented) A method of fabricating an electrical interconnection element having a contact tip structure, comprising:

forming a contact tip structure on a sacrificial substrate;

prior to constructing the contact tip structure, providing a texture in an area of the sacrificial substrate, wherein the contact tip structure is formed on the area of the sacrificial substrate which is formed with the texture;

attaching an electrical interconnection element to the contact tip structure to form a first structure having the electrical interconnection element and the contact tip structure; and

removing the contact tip structure from the sacrificial substrate wherein the first structure is compliant after said removing of the contact tip structure.

CLAIM 30 (Currently Amended) The method, according to claim 29, wherein providing [[a]] the texture comprises embossing.

CLAIM 31 (Currently Amended) The method, according to claim 29, wherein providing [[a]] the texture comprises forming a pit.

CLAIM 32 (Currently Amended) The method, according to claim [[29]] 30, wherein the embossing comprises forming [[a]] the raised contact surface.

CLAIM 33 (Previously Presented) The method, according to claim 29, wherein the contact tip structure comprises a surface layer.

CLAIM 34 (Previously Presented) The method, according to claim 33, wherein the contact tip comprises a surface material which in the finished product will form a contact layer of the contact tip structure.

CLAIM 35 (Previously Presented) The method, according to claim 34, wherein the surface material comprises a material suitable for making contact with an electronic component.

CLAIM 36 (Previously Presented) The method, according to claim 34, wherein the surface material comprises a material selected from the group consisting of Au, Cr, Co, Ni, Pd and Pt.

CLAIM 37 (Currently Amended) The method, according to claim 33, wherein the contact tip structure comprises a protuberance.

CLAIM 38 (Currently Amended) The method, according to claim 37, wherein the contact tip structure comprises gold.

CLAIM 39 (Currently Amended) The method, according to claim 37, wherein the tip structure material comprises a material selected from the group consisting of Au, Cu, Al, Ag, Ni and combinations thereof.

CLAIM 40 (Previously Presented) The method, according to claim 33, wherein the contact tip comprises a bonding material for joining to the contact tip structure.

CLAIM 41 (Previously Presented) The method, according to claim 40, wherein the bonding material comprises a material suitable for bonding to an interconnection element.

CLAIM 42 (Previously Presented) The method, according to claim 40, wherein the bonding material comprises a material selected from the group consisting of Au, Cr, Co, Ni, Pd and Pt.

CLAIM 43 (Previously Presented) The method, according to claim 29, wherein the contact tip structure is formed as an enlarged end.

CLAIM 44 (Previously Presented) The method, according to claim 29, wherein:

the electrical interconnection element is an elongated electrical conductor with a surface layer;

the elongated electrical conductor is readily shaped and comprises a material selected from the group consisting of: gold, aluminum, copper, nickel, palladium, gold alloy and copper alloy.

CLAIM 45 (Previously Presented) The method, according to claim 29, wherein the electrical interconnection element is elongate and provides the compliance of the first structure.

CLAIM 46 (Previously Presented) The method, according to claim 45, wherein the interconnection element has a compliant core element and a layer on the core element.

CLAIM 47 (Currently Amended) The method, according to claim 45, wherein the interconnection element has a compliant core element and a layer, on the core element, the layer comprising a material selected from the group consisting of Au, Cr, Co, Ni, Pd and Pt.

CLAIM 48 (Previously Presented) The method, according to claim 46, wherein the core element comprises gold.

CLAIM 49 (Currently Amended) The method, according to claim 46, wherein the core element comprises gold and the ~~surface~~ layer comprises a material selected from the group consisting of Au, Cr, Co, Ni, Pd and Pt.

CLAIM 50 (Previously Presented) The method, according to claim 46, wherein the layer comprises a material selected from the group consisting of Au, Cr, Co, Ni, Pd and Pt.

CLAIM 51 (Previously Presented) The method, according to claim 46, wherein the layer comprises nickel.

CLAIM 52 (Currently Amended) The method, according to claim 29, wherein said attaching is by a method selected from the group consisting of wire ~~bending~~bonding, solder bonding, and laser welding.

CLAIM 53 (Withdrawn) A method of fabricating a compliant electrical interconnection element comprising:

providing a sacrificial substrate having a texture in a region thereof;

forming an enlargement on said sacrificial substrate at said region resulting in said enlargement comprising a structure corresponding to said texture;

a compliant elongated electrical conductor being attached to said enlargement; and

removing said sacrificial substrate to form said compliant electrical interconnection element.

CLAIM 54 (Withdrawn) A method, according to claim 53, wherein said electrical interconnection comprises a coating.

CLAIM 55 (Withdrawn) A method, according to claim 53, wherein said coating is selected from the group consisting of Au, Cr, Ni, Cu, Ni and Pd.

CLAIM 56 (Withdrawn) A method, according to claim 53, wherein said electrical interconnection comprises a material selected from the group consisting of gold, gold alloy, copper, copper alloy, aluminum, nickel and palladium.

CLAIM 57 (Withdrawn) A method, according to claim 53, wherein said texture is a pit.

CLAIM 58 (Withdrawn) A method, according to claim 53, wherein said texture has a shape selected from the group consisting of hemispherical, rectangular and pyramidal.

CLAIM 59 (Withdrawn) A method, according to claim 53, wherein said corresponding texture is a protuberance.

CLAIM 60 (Withdrawn) A method, according to claim 53, wherein said texture is formed by a method selected from the group consisting of machining, stamping and embossing.

CLAIM 61 (Withdrawn) A method, according to claim 53, wherein said compliant elongated electrical conductor is attached to said enlargement by a method elected from the group consisting of solder bonding, wire bonding, laser welding and ultrasonic bonding.

CLAIM 62 (Withdrawn) A method of fabricating a compliant electrical interconnection element comprising:

providing a sacrificial substrate having a texture in a region thereof;

forming an enlargement on said sacrificial substrate at said region
resulting in said enlargement comprising a structure corresponding to said texture;

a compliant elongated electrical conductor being attached to said enlargement;

removing said sacrificial substrate to form said compliant electrical interconnection element;

said electrical interconnection comprises a coating;

said coating is selected from the group consisting of Au, Cr, Ni, Cu, Ni and Pd;

said electrical interconnection comprises a material selected from the group consisting of gold, gold alloy, copper, copper alloy, aluminum, nickel and palladium;

said texture is a pit having a shape selected from the group consisting of hemispherical, rectangular and pyramidal;

said corresponding texture is a protuberance;

said texture is formed by a method selected from the group consisting of machining, stamping and embossing; and

said compliant elongated electrical conductor is attached to said enlargement by a method elected from the group consisting of solder bonding, wire bonding, laser welding and ultrasonic bonding.

CLAIM 63 (Withdrawn) An assembly including an electronic component, the electronic component comprising:

a plurality of contact locations adjacent a surface of the electronic component,

a plurality of electrical conductors, each electrical conductors comprising,

a first end on the component that is at a position adjacent the surface of the electronic component but fanned out from a corresponding contact location,

a compliant elongated electrical conductor positioned at the first end of the electrical conductor,

an electrical connection between the corresponding terminal and the first end,

where the compliant elongated electrical conductor is free standing, having a first end fixed adjacent to the electronic component and having a second end at a position not adjacent the electronic component,

where the compliant elongated electrical conductor can be displaced such that the second end thereof moves in relation to the first end of the compliant contact structure, and

the assembly including an active semiconductor device connected to function at least in part by communication of electrical energy through at least one of the contact elements.

CLAIM 64 (Withdrawn) The assembly of claim 63, wherein the electronic component comprises a silicon substrate.

CLAIM 65 (Withdrawn) The assembly of claim 63, wherein the electronic component is mated directly with an active semiconductor device.

CLAIM 66 (Withdrawn) The assembly of claim 65, wherein the electronic component is a socket mated directly with and to securely connect to an active semiconductor device.

CLAIM 67 (Withdrawn) A method of making a fanout electrical contact structure, comprising:

providing a substrate having a surface and a plurality of contact locations adjacent the surface,

fabricating a plurality of fanned out electrical contact structures, this fabricating for at least one of the fanned out electrical contact structures comprising,

selecting a fanout area adjacent the surface of the substrate but fanned out from a corresponding contact location, which is a selected one of the plurality of a contact locations,

forming an electrical connection between the fanout area and the corresponding contact location,

forming a compliant elongated electrical conductor at the fanout area,

whereby the compliant elongated electrical conductor is electrically connected to the corresponding contact location,

where the compliant elongated electrical conductor is free standing, having a first end fixed adjacent to the electronic component and having a second end at a position not adjacent the electronic component, and

where the compliant elongated electrical conductor can be displaced such that the second end moves in relation to the first end of the elongated compliant electrical conductor.

CLAIM 68 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising:

disposing a patterned layer of conductive material to connect selected ones of the first ends on the component to selected ones of the plurality of contact locations.

CLAIM 69 (Withdrawn) The method of claim 68 of making a fanout electrical contact structure, wherein disposing the layer of conductive material further comprises:

forming a multilayer conductive/dielectric substrate over a region of the substrate.

CLAIM 70 (Withdrawn) The method of claim 69 of making a fanout electrical contact structure, further comprising:

a multilayered electrically conductive/dielectric substrate which comprises a patterned electrically conductive layer.

CLAIM 71 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising:

providing one or more layers of one or more conductive materials to connect selected ones of the fanout areas to selected ones of the plurality of contact locations.

CLAIM 72 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, wherein the electrical connection comprises a metal.

CLAIM 73 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, wherein the electrical connection comprises a metal/dielectric substrate.

CLAIM 74 (Withdrawn) The method of claim 73 of making a fanout electrical contact structure, wherein the electrical connection comprises copper.

CLAIM 75 (Withdrawn) The method of claim 73 of making a fanout electrical contact structure, wherein the electrical connection comprises a layer comprising gold.

CLAIM 76 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, wherein the electrical connection comprises a metal/polymer substrate.

CLAIM 77 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, wherein the electrical connection comprises a printed circuit board.

CLAIM 78 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising a plurality of dielectric films and a plurality of electrically conductive layers.

CLAIM 79 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising:

disposing a multilayer electrically conductive dielectric substrate over a region of the substrate, and

forming the compliant elongated electrical conductor by securing a first end of an elongated electrical conductor to the fanout location, the elongated electrical conductor is shaped to a compliant shape with a free

end displaced away from the surface of the substrate to form the compliant elongated electrical conductor, and

depositing a coating material over the elongated electrical conductor to form a compliant contact structure.

CLAIM 80 (Withdrawn) The method of claim 79 of making a fanout electrical contact structure, wherein the compliant contact structure comprises a coating comprising a material selected from the group consisting of nickel, copper, cobalt, gold and platinum.

CLAIM 81 (Withdrawn) The method of claim 79 of making a fanout electrical contact structure, wherein the elongated electrical conductor comprises a material selected from the group consisting of nickel, copper, gold, copper alloy, gold alloy, aluminum and palladium.

CLAIM 82 (Withdrawn) The method of claim 79 of making a fanout electrical contact structure, wherein the compliant contact structure comprises an elongated electrical conductor coated by a metallic coating.

CLAIM 83 (Withdrawn) The method of claim 82 of making a fanout electrical contact structure, wherein the elongated electrical conductor comprises gold and the metallic coating comprises nickel.

CLAIM 84 (Withdrawn) The method of claim 82 of making a fanout electrical contact structure, wherein the elongated electrical conductor is between about 1.0 and 5.0 mils.

CLAIM 85 (Withdrawn) The method of claim 82 of making a fanout electrical contact structure, further comprising extending the compliant contact structure away from the substrate distance of about 100 mils.

CLAIM 86 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising:

disposing a multilayer conductive/dielectric substrate over a region of the substrate,

forming the compliant contact structure by securing an elongated electrical conductor in the fanout location, the elongated electrical conductor shaped to a compliant shape with a free end displaced away from the surface of the substrate, and

depositing a coating material over the elongated electrical conductor to form a compliant contact structure.

CLAIM 87 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, further comprising:

providing a first fanout substrate and a second fanout substrate disposed on said first fanout substrate.

CLAIM 88 (Withdrawn) The method of claim 87 of making a fanout electrical contact structure wherein said second fanout substrate is a thin film wiring structure.

CLAIM 89 (Withdrawn) The method of claim 88 of making a fanout electrical contact structure, wherein said thin film wiring layer is a multilayer wiring structure comprising a plurality of patterned dielectric layers and a plurality of patterned electrically conductive layers.

CLAIM 90 (Withdrawn) The method of claim 67 of making a fanout electrical contact structure, wherein the space between at least some pairs of terminals is on the order of about 8 mils.

CLAIM 91 (Withdrawn) A method of making a fanout electrical contact structure, comprising:

providing a substrate having a surface and a plurality of contact locations adjacent the surface,

fabricating a plurality of fanout electrical contact structures, this fabricating for at least one of the fanout electrical contact structures comprising,

forming a compliant contact structure, at least part of which is adjacent the surface of the substrate but fanned out from a corresponding contact location, which is a selected one of the plurality of contact locations,

forming an electrical connection between the compliant contact structure and the corresponding terminal,

whereby the compliant contact structure is electrically connected to the corresponding contact location,

where the compliant contact structure is free standing, having an end fixed adjacent to the electronic component and having a second end at a position not adjacent the electronic component, and

where the compliant contact structure can be displaced such that the second end moves in relation to the end of the compliant contact structure.

CLAIM 92 (Withdrawn) An assembly comprising:

an electric component;

said electronic component comprising a substrate;

said substrate has a surface;

a plurality of contact locations at said surface;

a fanout member;

said fanout member comprises an electrical conductor comprising a contact location end and a fanout location end;

said contact location end is electrically connected to at least one of said plurality of contact locations at said surface;

said fanout location end is displaced relative to said at least one of said plurality of contact locations;

an elongated electrical conductor comprising a first end and a second end;

said first end of said elongated electrical conductor is electrically connected to said fanout location end;

said second end of said elongated electrical conductor is not adjacent said electronic component;

said elongated electrical conductor is free standing;

said elongated electrical conductor is compliant and can be displaced so that said second end thereof moves in relation to the first end of said elongated electrical conductor; and

said assembly including an active semiconductor device connected to function by communication of electrical power through at least one said elongated electrical conductors.

CLAIM 93 (Withdrawn) The assembly according to claim 92, wherein said elongated electrical conductor has a coating.

CLAIM 94 (Withdrawn) The assembly according to claim 93, wherein said coating is selected from the groups consisting of Au, Cr, Co, Ni and Pd.

CLAIM 95 (Withdrawn) The assembly according to claim 92, wherein said elongated electrical conductor comprises a material selected from the group consisting of gold, aluminum, copper, nickel, palladium, gold alloy and copper alloy.

CLAIM 96 (Withdrawn) The assembly according to claim 92, wherein said fanout member comprises a thin film wiring structure.

CLAIM 97 (Withdrawn) The assembly according to claim 92, wherein said fanout member is a space transformer substrate.

CLAIM 98 (Withdrawn) An assembly comprising:

an electric component;

said electronic component comprising a substrate;

said substrate has a surface;

a plurality of contact locations at said surface;

a fanout member;

said fanout member comprises an electrical conductor comprising a contact location end and a fanout location end;

said contact location end is electrically connected to at least one of said plurality of contact locations at said surface;

said fanout location end is displaced relative to said at least one of said plurality of contact locations;

an elongated electrical conductor comprising a first end and a second end;

said first end of said elongated electrical conductor is electrically connected to said fanout location end;

said second end of said elongated electrical conductor is not adjacent said electronic component;

said elongated electrical conductor is free standing; and

said elongated electrical conductor is compliant and can be displaced so that said second end thereof moves in relation to the first end of said elongated electrical conductor.

CLAIM 99 (Withdrawn) A method of fabricating a fanout electrical contact structure comprising:

providing a substrate;

said substrate has a surface;

fabricating a plurality of contact locations at said surface;

fabricating a fanout member;

said fanout member comprises an electrical conductor comprising a contact location end and a fanout location end;

electrically connecting said contact location end to at least one of said plurality of contact locations at said surface;

fabricating said fanout member so that said fanout location end is displaced relative to said at least one of said plurality of contact locations;

fabricating an elongated electrical conductor comprising a first end and a second end;

electrically connecting said first end of said elongated electrical conductor to said fanout location end;

said second end of said elongated electrical conductor is not adjacent said electronic component;

said elongated electrical conductor is free standing; and

said elongated electrical conductor is compliant and can be displaced so that said second end thereof moves in relation to the first end of said elongated electrical conductor.

CLAIM 100 (Withdrawn) The method according to claim 99, further including coating said elongated electrical conductor with a coating material.

CLAIM 101 (Withdrawn) The method according to claim 100, wherein said coating is material selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 102 (Withdrawn) The method according to claim 99, wherein said elongated electrical conductor comprises a material selected from the group consisting of gold, aluminum, copper, nickel, aluminum, gold alloy and copper alloy.

CLAIM 103 (Withdrawn) The method according to claim 99, wherein said fanout member comprises a thin film wiring structure.

CLAIM 104 (Withdrawn) The method according to claim 99, wherein said fanout member is a space transformer substrate.

CLAIM 105 (Withdrawn) A method of fabricating a fanout electrical contact structure comprising:

- providing a substrate;

- said substrate has a surface;

- fabricating a plurality of contact locations at said surface;

- fabricating a fanout member;

- said fanout member comprises an electrical conductor comprising a contact location end and a fanout location end;

- electrically connecting said contact location end to at least one of said plurality of contact locations at said surface;

- fabricating the fanout member so that said fanout location end is displaced relative to said at least one of said plurality of contact locations;

- fabricating an elongated electrical conductor comprising a first end and a second end;

electrically connecting said first end of said elongated electrical conductor to said fanout location end;

said second end of said elongated electrical conductor is not adjacent said electronic component;

said elongated electrical conductor is free standing;

said elongated electrical conductor is compliant and can be displaced so that said second end thereof moves in relation to the first end of said elongated electrical conductor; and
electrically connecting said elongate electrical conductor to a semiconductor device.

CLAIM 106 (Withdrawn) A semiconductor assembly comprising:

an assembly substrate;

at least one semiconductor die; and

a plurality of free standing elongate flexible interconnection elements located between the die and the assembly substrate, each having a first portion contacting the assembly substrate and a second portion contacting the semiconductor die, each elongate flexible interconnection element extends from one of the semiconductor die and the assembly substrate, where after the elongate flexible interconnection element alters direction at least once, and each elongate flexible interconnection element includes an elongate flexible element of a first material, and a second material on the elongate flexible element wherein the elongate flexible element with the second material thereon is compliant.

CLAIM 107 (Withdrawn) The semiconductor assembly of claim 106, wherein the substrate has a first set of contact pads and the semiconductor die has a second set of contact pads and each elongate flexible interconnection element has a first portion contacting a respective contact pad of the first set of contact pads, and a second portion contacting a respective contact pad of the second set of contact pads.

CLAIM 108 (Withdrawn) The semiconductor assembly of claim 106, wherein the elongate flexible interconnection element has a portion permanently attached to the assembly substrate.

CLAIM 109 (Withdrawn) An electronic assembly comprising:

- a first substrate having a first set of contact pads;

- a second substrate having a second set of contact pads; and

- a plurality of elongate flexible interconnection elements located between the first substrate and the second substrate, each being free standing and having a portion permanently attached to a respective contact pad of the first set of contact pads and a second portion contacting a respective contact pad of the second set of contact pads, each elongate flexible interconnection element extending from the first substrate, whereafter the elongated flexible interconnection element alters direction at least once, each elongated flexible interconnection element including an elongated flexible element of a first material, and a second material on the elongated flexible element wherein the elongate flexible element with the second material thereon is compliant, the first and second substrates being brought into fixed relationship relative to one another.

CLAIM 110 (Withdrawn) The electronic assembly of claim 109, wherein one of the substrates comprises a material selected from the group consisting of a semiconductor

die, a printed circuit board, a plastic substrate, a ceramic substrate, and a polymer based substrate.

CLAIM 111 (Withdrawn) The electronic assembly of claim 109, wherein one of the substrates is a semiconductor die.

CLAIM 112 (Withdrawn) The electronic assembly of claim 109, wherein the second substrate is a semiconductor die.

CLAIM 113 (Withdrawn) The electronic assembly of claim 109, wherein, for each interconnection element of a first plurality of the free standing interconnection elements, a contact region distant from the substrate on a given interconnection element is substantially in a common plane with corresponding contact regions of the first plurality of interconnection elements.

CLAIM 114 (Withdrawn) The electronic assembly of claim 109, wherein the elongated flexible element has a portion connected to a respective terminal of the first set of contact pads.

CLAIM 115 (Withdrawn) The electronic assembly of claim 114, wherein an end of the elongated flexible element is connected to the respective terminal.

CLAIM 116 (Withdrawn) The electronic assembly of claim 109, wherein the second material passivates of the interconnection element.

CLAIM 117 (Withdrawn) The electronic assembly of claim 109, wherein the first material includes a material selected from the group consisting of gold, aluminum, copper, nickel, palladium, gold alloy and copper alloy.

CLAIM 118 (Withdrawn) The electronic assembly of claim 109, wherein the first material includes a material selected from the group consisting of gold, aluminum and copper.

CLAIM 119 (Withdrawn) The electronic assembly of claim 109, wherein the elongate flexible element has a cross-dimension of between 0.001 and 0.005 inches.

CLAIM 120 (Withdrawn) The electronic assembly of claim 109, wherein the elongate flexible element is a wire.

CLAIM 121 (Withdrawn) The electronic assembly of claim 109, wherein the second material is connected to the respective terminal.

CLAIM 122 (Withdrawn) The electronic assembly of claim 109, wherein the second material is stronger than the elongate flexible element.

CLAIM 123 (Withdrawn) The electronic assembly of claim 109, wherein the second material is a coating which is deposited around the elongate flexible element.

CLAIM 124 (Withdrawn) The electronic assembly of claim 109, wherein the second material comprises a material selected from the group consisting of nickel, cobalt, copper, gold, platinum and palladium.

CLAIM 125 (Withdrawn) The electronic assembly of claim 109, wherein the second material comprises a material selected from the group consisting of nickel and cobalt.

CLAIM 126 (Withdrawn) The electronic assembly of claim 109, wherein the second material is a thin layer.

CLAIM 127 (Withdrawn) The electronic assembly of claim 109, wherein the second material is selected from the group consisting of an electroplated, electrolessly plated, sputtered and e-beam evaporated coating.

CLAIM 128 (Withdrawn) The electronic assembly of claim 109, wherein the elongate flexible element has a cross-dimension of between 0.001 and 0.005 inches and the second material is a thin layer.

CLAIM 129 (Withdrawn) The electronic assembly of claim 109, wherein the first material and the second material are both conductive.

CLAIM 130 (Withdrawn) The electronic assembly of claim 129, wherein the second material is formed directly on the elongate element.

CLAIM 131 (Withdrawn) The electronic assembly of claim 109, wherein the first material comprises a material selected from the group consisting of gold, gold alloy, copper, copper alloy, aluminum, nickel and the second material is selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 132 (Withdrawn) The electronic assembly of claim 109, wherein the first material includes a material selected from the group consisting of gold, aluminum and copper, and the second material includes a material selected from the group consisting of nickel and cobalt.

CLAIM 133 (Withdrawn) The electronic assembly of claim 109, wherein the elongate flexible element is a core element and the second material is located around the core element.

CLAIM 134 (Withdrawn) A structure comprising:

an assembly substrate;

at least one semiconductor die; and

a plurality of free standing elongate flexible interconnection elements located between the die and the assembly substrate, each having a first portion contacting the assembly substrate and a second portion contacting the semiconductor die, each elongate flexible interconnection element extends from one of the semiconductor die and the assembly substrate, whereafter the elongate flexible interconnection element alters direction at least once, and each elongate flexible interconnection element includes an elongate flexible element of a first material, and a second material on the elongate flexible element wherein the elongate flexible element with the second material thereon is compliant.

CLAIM 135 (Withdrawn) A structure comprising:

a first substrate having a first set of contact pads;

a second substrate having a second set of contact pads; and

a plurality of elongate flexible interconnection elements located between the first substrate and the second substrate, each being free standing and having a portion permanently attached to a respective contact pad of the first set of contact pads and a second portion contacting a respective contact pad of the second set of contact pads, each elongate flexible interconnection element extending from the first substrate, whereafter the elongate flexible interconnection element alters direction at least once, each elongate flexible interconnection element including an elongate flexible element of a first material, and a second material on the elongate flexible element wherein the elongate flexible element with the second material thereon is compliant, the first and second substrates being brought into fixed relationship relative to one another.

CLAIM 136 (Withdrawn) The semiconductor assembly of claim 106, wherein said assembly is a probe for a semiconductor device.

CLAIM 137 (Withdrawn) The semiconductor assembly of claim 106, wherein said assembly is a connector for a semiconductor device.

CLAIM 138 (Withdrawn) The semiconductor assembly of claim 109, wherein said assembly is a probe for a semiconductor device.

CLAIM 139 (Withdrawn) The semiconductor assembly of claim 109, wherein said assembly is a connector for a semiconductor device.

CLAIM 140 (Withdrawn) The semiconductor assembly of claim 106, wherein said structure is a probe for a semiconductor device.

CLAIM 141 (Withdrawn) The semiconductor assembly of claim 106, wherein said structure is a connector for a semiconductor device.

CLAIM 142 (Withdrawn) The semiconductor assembly of claim 109, wherein said structure is a probe for a semiconductor device.

CLAIM 143 (Withdrawn) The semiconductor assembly of claim 109, wherein said structure is a connector for a semiconductor device.

CLAIM 144 (Withdrawn) A semiconductor device comprising:

a silicon body having a plurality of contact locations;

a plurality of free-standing elongated electrical conductors, each of the elongated electrical conductors having a first end, a second end, and a compliant section between the first end and the second end, selected

ones of the free-standing elongated electrical conductors each mounted by a first end thereof to and extending from a respective selected one of the contact locations and the respective compliant section thereof flexing against compliant action when a force is applied to the respective second end thereof and to compliantly respond when the force is relieved; and

the second ends of the elongated electrical conductors are at an angle with respect to said first end and the contact location, the angle being between a minimum and a maximum value.

CLAIM 145 (Withdrawn) A semiconductor device, according to claim 144, wherein:

the elongated electrical conductors having a second end at an angle with respect to the first end have a bend to accommodate the angle between the minimum and maximum angle.

CLAIM 146 (Withdrawn) A semiconductor device, according to claim 145, wherein:

the contact locations are disposed a first distance apart;

the second ends of the elongated electrical conductors are disposed at a second distance apart; and

the second distance is determined by the angle.

CLAIM 147 (Withdrawn) A semiconductor device, according to claim 146, wherein:

the first distance is approximately 5 mils.

CLAIM 148 (Withdrawn) A semiconductor device, according to claim 145, further comprising:

a dielectric material extending over a surface of the silicon body and enveloping a portion of the elongated electrical conductors.

CLAIM 149 (Withdrawn) A semiconductor device, according to claim 145, wherein:

the silicon body is covered by an electrically insulating coating having holes and comprises electrically conductive throughholes and electrical conductors electrically connected to the contact locations.

CLAIM 150 (Withdrawn) A semiconductor device, according to claim 145, further comprising:

metallization covering the elongated electrical conductors.

CLAIM 151 (Withdrawn) A semiconductor device, according to claim 145, wherein:

the elongated electrical conductors are composite structures.

CLAIM 152 (Withdrawn) A semiconductor device, according to claim 145, wherein:

the contact structures are resilient contact structures.

CLAIM 153 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of resilient, elongated electrical conductors, wherein:

(i) each elongated electrical conductor has a first end attached to a respective one of the contact locations, and a second end, distant from the substrate, the second ends of the elongated electrical conductors are at

an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value and the first end of a first of the elongated electrical conductors is spaced from the first end of a second, adjacent one of the elongated electrical conductors by a first distance and the second end of the first elongated electrical conductor is spaced from the second end of the second elongated electrical conductor by a second distance which is determined by the angles corresponding to the first and second elongated electrical conductors; and

(ii) each elongated electrical conductor comprises a flexible elongated element, and a second material on the flexible elongated element, the flexible elongated element having a first composition and the second material having a second composition which is different from the first composition.

CLAIM 154 (Withdrawn) The electronic assembly of claim 153, wherein the first composition comprises a material selected from the group consisting of gold, aluminum, copper, nickel, platinum, gold alloy, copper alloy and palladium.

CLAIM 155 (Withdrawn) The electronic assembly of claim 153, wherein the first material comprises gold.

CLAIM 156 (Withdrawn) The electronic assembly of claim 153, wherein the second material is selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 157 (Withdrawn) The electronic assembly of claim 153, wherein at least one layer of the second material is selected from the group consisting of nickel and cobalt.

CLAIM 158 (Withdrawn) The electronic assembly of claim 153, wherein the flexible elongated electrical conductor has disposed thereon the second material.

CLAIM 159 (Withdrawn) The electronic assembly of claim 153, wherein the second material is selected from the group consisting of an electroless plated coating, an e-beam deposited coating, a sputter deposited coating and an electroplated coating.

CLAIM 160 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of flexible elongated electrical conductors, each flexible elongated electrical conductor having a first end attached to a respective one of the contact locations and a second end, distant from the substrate, which are resiliently depressible towards the substrate, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value wherein:

(i) the first ends of two of the flexible elongated electrical conductors located next to one another are spaced by a first distance from one another; and

(ii) the second ends of the two elongated electrical conductors are spaced by a second distance from one another which is determined by the angle corresponding to the first and second elongated electrical conductors both

(a) when the two flexible elongated electrical conductors are not depressed towards the substrate and

(b) when the second ends are depressed towards the substrate; and

(iii) each elongated electrical conductor comprises a flexible elongated element of a first material, and a second material on the flexible elongated

element, the flexible elongated element having a first composition and the second material having a second composition which is different from the first composition.

CLAIM 161 (Withdrawn) The electronic assembly of claim 160, wherein the second end of each flexible elongated electrical conductor is an area of the flexible elongated electrical conductor which is most distant from the substrate and remains most distant both when the flexible elongated electrical conductor is not depressed towards the substrate and when the second end is depressed towards the substrate.

CLAIM 162 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of flexible elongated electrical conductors, each flexible elongated electrical conductor having a first end attached to a respective one of the contact locations, and a second end most distant from the substrate, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, the flexible elongated electrical conductor is resiliently depressible towards the substrate, wherein the first locations of two of the flexible elongated electrical conductor located next to one another are spaced from one another by a first distance and the second ends of the two elongated electrical conductors are spaced from one another by a second distance which is determined by the angles corresponding to the first and second flexible elongated electrical conductors, the second ends of each of the two flexible elongated electrical conductors being an area of the flexible elongated electrical conductor which is most distant from the substrate and remaining most distant from the substrate after depression of the second end towards the substrate, each flexible elongated electrical

conductor comprising a flexible elongated element of a first material, and a second material on the flexible elongated element, the flexible elongated electrical conductor having a first composition and the second material having a second composition.

CLAIM 163 (Withdrawn) A semiconductor device comprising:

a silicon body having a plurality of contact locations; and

a plurality of free-standing elongated electrical conductors, each of the free-standing elongated electrical conductors having a first end, a second end, a first portion having a first bend, and a second portion having a second bend selected ones of the free-standing elongated electrical conductors mounted by a respective first end thereof to and extending from a respective selected one of the contact locations, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value; wherein the second ends of at least a portion of the elongated electrical conductors are spaced apart as determined by the angles corresponding to the first and second elongated electrical conductors.

CLAIM 164 (Withdrawn) A semiconductor device comprising:

a silicon body having a plurality of contact locations; and

a plurality of free-standing elongated electrical conductors, and each of the free-standing elongated electrical conductors having a first end and a second end, selected ones of the free-standing elongated electrical conductors mounted by a respective first end thereof to and extending from a respective selected one of the contact locations, the second ends

of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value; wherein

- (i) the contact locations are spaced approximately 5 mils apart; and
- (ii) the second ends are spaced as determined by the angles corresponding to the first and second elongated electrical conductors.

CLAIM 165 (Withdrawn) A semiconductor device comprising:

a silicon body having a plurality of contact locations;

a plurality of free-standing elongated electrical conductors, each of the free-standing elongated electrical conductors having a first end and a second end, selected ones of the free-standing elongated electrical conductors mounted by a respective first end thereof to and extending from a respective selected one of the contact locations, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, wherein second ends of at least a portion of the elongated electrical conductors are spaced apart as determined by the angles corresponding to the first and second elongated electrical conductors; and

a dielectric material extending over a surface of the silicon body and enveloping a portion of the elongated electrical conductors.

CLAIM 166 (Withdrawn) A semiconductor device comprising:

a silicon body having a plurality of contact locations;

a plurality of free-standing elongated electrical conductors, each of the free-standing elongated electrical conductors having a first end and a second end, selected ones of the free-standing elongated electrical conductors mounted by a respective first end thereof to and extending from a respective selected one of the contact locations, wherein the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value:

(i) second ends of at least a portion of the second ends are spaced as determined by the angles corresponding to the first and second elongated electrical conductors;

(ii) the silicon body is covered by an electrically insulating coating having through holes therethrough whereby the contact locations are accessible through the electrically insulating coating;

(iii) a plurality of additional conductive material elements extend through the passivation layer to contact the contact locations; and

(iv) the elongated electrical conductor are mounted to the additional conductive material.

CLAIM 167 (Withdrawn) A semiconductor device, according to claim 166, further comprising:

metallization covering the elongated electrical conductor.

CLAIM 168 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of resilient, elongated electrical conductors:

(i) each elongated electrical conductor has a first end attached to a respective one of the contact locations, and a second end, distant from the substrate, the second end of the elongated electrical conductor is at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, and the first end of a first of the elongated electrical conductors is spaced from the first end of a second, adjacent one of the elongated electrical conductors by a first distance and the second end of the first elongated electrical conductor is spaced from the second end of the second elongated electrical conductor by a second distance which is determined by the angles corresponding to the first and second elongated electrical conductors;

(ii) each elongated electrical conductor comprises a flexible elongated element of a first material being gold, and a second material on the flexible elongated element, the flexible elongated element having a first composition and the coating having a second composition which is different from the first composition.

CLAIM 169 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of resilient, elongated electrical conductors:

(i) each elongated electrical conductor has a first end attached to a respective one of the contact locations, and a second end, distant from the

substrate, wherein the second end of the elongated electrical conductor is at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, and the first end of a first of the elongated electrical conductors is spaced from the first end of a second, adjacent one of the elongated electrical conductors by a first distance and the second end of the first elongated electrical conductor is spaced from the second end of the second elongated electrical conductor by a second distance which is determined by the angles corresponding to the first and second elongated electrical conductors; and

(ii) each elongated electrical conductor comprises a flexible elongated electrical conductor of a first material, and a second material on the flexible elongated element, the flexible elongated element having a first composition and the coating having a second composition which is different from the first composition.

CLAIM 170 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of resilient, elongated electrical conductors:

(i) each elongated electrical conductor has a first end attached to a respective one of the contact locations, and a second end, distant from the substrate wherein the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, and the first contact location of a first of the elongated electrical conductors is spaced from the first end of a second, adjacent one of the elongated electrical conductors by a first distance and

the second end of the first elongated electrical conductor is spaced from the second end of the second elongated electrical conductor by a distance which is determined by the angles corresponding to the first and second elongated electrical conductors; and

(ii) each elongated electrical conductor comprises a flexible elongated element of a first material, and a second material, comprising nickel, iron or cobalt, on the flexible elongated element, the flexible elongated element having a first composition and the coating having a second composition which is different from the first composition.

CLAIM 171 (Withdrawn) An electronic assembly comprising:

a substrate having a plurality of contact locations on one side thereof; and

a plurality of resilient, elongated electrical conductors:

(i) each elongated electrical conductor has a first end attached to a respective one of the contact locations, and a second end, distant from the substrate wherein the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and maximum value, and the first end of a first of the elongated electrical conductor is spaced from the first end of a second, adjacent one of the elongated electrical conductors by a first distance and the second ends of the first elongated electrical conductor is spaced from the second end of the second elongated electrical conductor by a second distance which is determined by the angles corresponding to the first and second elongated electrical conductors; and

(ii) each elongated electrical conductor comprises a flexible elongated element of a first material, and a second material on the flexible elongated

element, the flexible elongated element having a first composition and the coating having a second composition which is different from the first composition.

CLAIM 172 (Withdrawn) A semiconductor device according to any one of claims 144, 163, 164, 165 or 166, wherein the minimum value is 5 degrees and the maximum value is 60 degrees.

CLAIM 173 (Withdrawn) A semiconductor device according to any one of claims 144, 163, 164, 165 or 166, wherein as a result of the angle being between the minimum and the maximum values, the second ends are at a spacing different than the spacing of the first ends.

CLAIM 174 (Withdrawn) An electronic assembly according to anyone of claims 153, 160, 162, 168, 169, 170 or 171, wherein the minimum value is 5 degrees and the maximum value is 60 degrees.

CLAIM 175 (Withdrawn) An electronic assembly according to anyone of claims 153, 160, 162, 168, 169, 170 or 171, wherein as a result of the angle being between the minimum and the maximum values, the second ends are at a spacing different than the spacing of the first ends.

CLAIM 176 (Withdrawn) A structure comprising:

a substrate having a plurality of contact locations thereon;

a plurality of elongated electrical conductors, each having a first end and a second end;

said first end is electrically connected to one of said contact locations;

the second end of the elongated electrical conductor is at an angle with respect to said first end and said contact location to which said first end is electrically connected, the angle being between a minimum and a maximum value.

CLAIM 177 (Withdrawn) A structure according to claim 176, wherein the minimum value is 5 degrees and the maximum value is 60 degrees.

CLAIM 178 (Withdrawn) A structure according to claim 176, wherein as a result of the angle being between said minimum and said maximum values, the second ends are at a spacing different than the spacing of the first ends.

CLAIM 179 (Withdrawn) A structure according to claim 176, further including a coating on said elongated electrical conductors.

CLAIM 180 (Withdrawn) A structure according to claim 179, wherein the elongated electrical conductor comprises a first material and the coating comprises a second material.

CLAIM 181 (Withdrawn) A structure according to claim 180, wherein the second material is different than said first material.

CLAIM 182 (Withdrawn) A structure according to claim 176, wherein the elongated electrical conductor comprises a material selected from the group consisting of gold, aluminum, nickel, platinum, gold alloy, copper alloy and palladium.

CLAIM 183 (Withdrawn) A structure according to claim 179, wherein said coating comprises a material selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 184 (Withdrawn) A structure according to claim 176, wherein said substrate comprises silicon.

CLAIM 185 (Withdrawn) A structure according to claim 176, wherein said substrate comprises an electrically insulating coating.

CLAIM 186 (Withdrawn) A structure according to claim 176, wherein said substrate comprises electrical conductors and electrically conductive throughholes electrically interconnected to the contact locations and to the electrical conductors.

CLAIM 187 (Withdrawn) A structure according to claim 176, wherein said elongated electrical conductor is compliant and can be displaced so that the second end thereof moves in relation to the first end of said elongated electrical conductor when the second end is pressed against a surface.

CLAIM 188 (Withdrawn) A structure according to claim 176, wherein said elongated electrical conductor compliantly responds when said second end is released from being pressed against said surface.

CLAIM 189 (Withdrawn) A semiconductor structure according to anyone of claims 144, 163, 164, 165 or 166, wherein the angle is nonorthogonal to the contact location.

CLAIM 190 (Withdrawn) An electronic assembly according to anyone of claims 153, 160, 162, 168, 169, 170, or 171, wherein the angle is nonorthogonal to the contact location.

CLAIM 191 (Withdrawn) A structure according to anyone of claims 176 to 190 or 192 to 194, wherein said angle is nonorthogonal to said one of said contact locations.

CLAIM 192 (Withdrawn) A structure according to anyone of claims 176 to 191 or 193 to 194, wherein the elongated electrical conductors are free-standing.

CLAIM 193 (Withdrawn) A structure according to anyone of claims 176 to 192 or 194, further including a dielectric material disposed on said substrate and enveloping a portion of said elongated electrical conductor.

CLAIM 194 (Withdrawn) A structure according to anyone of claims 176 to 193, wherein said elongated electrical conductors are compliant.

CLAIM 195 (Withdrawn) A structure comprising:

- a substrate having first and second opposed sides with a first set of contact locations on the first side and a second set of contact locations on the second side;

- a first set of resilient elongated electrical conductors, each having a first end electrically interconnected to a respective one of the contact locations of the first set of contact locations,

- a second end distant from the substrate, and an elongated section extending from the first end to the second end, the elongated section resiliently bending upon depression of the second end towards the substrate, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, wherein the second ends of two adjacent resilient contact structures are spaced as determined by the angles corresponding to the first and second elongated electrical conductors and wherein respective ones of the second set of contact locations are coupled to corresponding ones of the first set of contact locations; and

- a second set of resilient elongated electrical conductors, each having a first end electrically interconnected to a respective one of the contact

locations of the second set of contact locations, a second end distant from the substrate, and an elongate section extending from the first end to the second end, the elongated section resiliently bending upon depression of the second end towards the substrate.

CLAIM 196 (Withdrawn) A structure, according to claim 195, further comprising:

an enlargement at ends of the first plurality of resilient elongated electrical conductors.

CLAIM 197 (Withdrawn) A structure, according to claim 195, wherein:

the first plurality of resilient contact structures are composite electrical interconnection elements.

CLAIM 198 (Withdrawn) A structure, according to claim 195, wherein:

the first plurality of resilient elongated electrical conductors are fabricated on a sacrificial substrate prior to electrical interconnection of the first plurality of elongated electrical conductors to the first plurality of contact locations.

CLAIM 199 (Withdrawn) A structure, according to claim 195, further comprising:

a subset of the second set of elongated electrical conductors directly electrically interconnected to the second set of contact locations.

CLAIM 200 (Withdrawn) A structure, according to claim 199, wherein:

the second plurality of elongated electrical conductors are composite interconnection elements.

CLAIM 201 (Withdrawn) A structure, according to claim 199, wherein:

the second plurality of resilient elongated electrical conductors are fabricated on a sacrificial substrate prior to electrically interconnecting the second plurality of resilient elongated electrical conductors to the second plurality of contact locations.

CLAIM 202 (Withdrawn) A Probe Assembly, comprising:

a second space transformer having a first surface, a second surface and a first plurality of contact locations on the first surface thereof;

an interconnection structure having a first surface, a second surface, a second plurality of elongated resilient electrical conductors extending from the second surface thereof and a first plurality of elongated resilient electrical conductors extending from the first surface thereof; and

a first space transformer having a first surface, a second surface, a plurality of contact locations disposed on the second surface thereof, and a third plurality of elongated resilient electrical conductors extending from the first surface thereof; wherein:

the second plurality of elongated resilient electrical conductors effect a pressure connection with the contact locations of the second space transformer; and

the first plurality of elongated resilient electrical conductors effect a pressure connection with the contact locations of the first space transformer.

CLAIM 203 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the third plurality of elongated resilient electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 204 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the first plurality of elongated resilient electrical conductors are composite electrical interconnection elements.

CLAIM 205 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the second plurality of elongated resilient electrical conductors are composite electrical interconnection elements.

CLAIM 206 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the third plurality of elongated resilient electrical conductors are composite electrical interconnection elements.

CLAIM 207 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

one or more of the first plurality of elongated resilient electrical conductors are a composite structure comprising an elongated element and a coating.

CLAIM 208 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

one or more of the second plurality of elongated resilient electrical conductors are a composite structure comprising an elongated element and a coating.

CLAIM 209 (Withdrawn) A structure, according to claim 202, further comprising:

a clamp for holding the first space transformer in place with respect to said second space transformer,

the clamp comprises a sheet of material supported by a member perpendicularly disposed with respect to the second space transformer;

means for affixing the sheet to the member; and

means for urging the first space transformer towards the first surface of the second space transformer.

CLAIM 210 (Withdrawn) A Probe Assembly, according to claim 209, wherein said clamps comprises a sheet made of aluminum.

CLAIM 211 (Withdrawn) A Probe Assembly, according to claim 209, wherein the means for urging the first space transformer comprises:

1 the sheet of material; and

a screw holding the sheet in place with respect to the member and the second space transformer with the first space transformer captured therebetween.

CLAIM 212 (Withdrawn) A Probe Assembly, according to claim 211, wherein:

said sheet comprises aluminum.

CLAIM 213 (Withdrawn) A Probe Assembly, according to claim 211, further comprising:

a member perpendicularly disposed with respect to the second space transformer for supporting the sheet of material.

CLAIM 214 (Withdrawn) A Probe Assembly, according to claim 209, wherein the clamp comprises means for affixing a sheet of material supported by a member perpendicularly disposed with respect to the second space transformer, the sheet is held in place to the member by a screw forming the clamp to hold the first space transformer in place with respect to the second space transformer.

CLAIM 215 (Withdrawn) A Probe Assembly, according to claim 214, wherein:

the sheet and the member are made of aluminum.

CLAIM 216 (Withdrawn) Probe Assembly, according to 202, further comprising:

means for aligning of the first space transformer relative to the second space transformer.

CLAIM 217 (Withdrawn) A Probe Assembly, according to claim 216, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 218 (Withdrawn) A Probe Assembly, according to claim 216, wherein the means for aligning the first space transformer comprises:

a plurality of projections for mating with grooves on the interconnection structure.

CLAIM 219 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the contact locations are disposed at a first pitch on the second surface of the second space transformer;

the third plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the second space transformer.

CLAIM 220 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the first plurality of elongated resilient electrical conductors are disposed at a first pitch on the first surface of the interconnection structure;

the second plurality of elongated resilient electrical conductors are disposed at a second pitch on the second surface of the interconnection structure.

CLAIM 221 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the contact locations are disposed at a first pitch on the second surface of the first space transformer;

the third plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the second space transformer;

the first plurality of elongated resilient electrical conductors are disposed at the first pitch on the first surface of the interconnection structure;

the second plurality of elongated resilient electrical conductors are disposed at the first pitch on the second surface of the interconnection structure.

CLAIM 222 (Withdrawn) A Probe Assembly, according to claim 202, wherein at least some of the elongated resilient electrical conductors comprise:

a composite interconnection element having an end; and

a tip structure disposed at the end of the composite interconnection element.

CLAIM 223 (Withdrawn) A structure, according to claim 202, wherein:

the third plurality of elongated resilient electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 224 (Withdrawn) A structure, comprising:

a first space transformer having a first surface, a second surface, a plurality of contact locations disposed on the second surface thereof, and a plurality of elongated electrical conductors connected to the first surface thereof, said first space transformer adapted in use such that ends of the plurality of elongated electrical conductors for making pressure contacts with a corresponding plurality of contact locations on a semiconductor wafer; and

an interconnection structure having a first surface, a second surface, a first plurality of elongated resilient electrical conductors extending from the first surface thereof, said electrical interconnection structure adapted in use such that contact regions of the first plurality of elongated resilient electrical conductors make pressure connections with the plurality of contact locations on the second surface of the first space transformer, the electrical interconnection structure having a second plurality of elongated

resilient electrical conductors extending from the second surface thereof, said interconnection structure adapted in use for contact locations of the second plurality of elongated resilient electrical conductors making pressure connections with a plurality of contact locations on a second space transformer.

CLAIM 225 (Withdrawn) A structure, according to claim 224, wherein:

the contact locations are disposed at a first pitch on the second surface of the first space transformer;

the plurality of elongated electrical conductors are disposed at a second pitch on the first surface of the first space transformer.

CLAIM 226 (Withdrawn) A structure, according to claim 224, wherein:

the second plurality of elongated resilient electrical conductors are disposed at a first pitch on the second surface of the interconnection structure;

the first plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the interconnection structure.

CLAIM 227 (Withdrawn) A structure, according to claim 224, wherein:

the contact locations are disposed at a first pitch on the second surface of the space transformer;

the plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the space transformer;

the second plurality of elongated resilient electrical conductors are disposed at the first pitch on the second surface of the electrical interconnection structure;

the first plurality of elongated resilient electrical conductors are disposed at the first pitch on the first surface of the electrical interconnection structure.

CLAIM 228 (Withdrawn) A Probe Assembly, comprising:

a second space transformer having a first surface, a second surface and a plurality of second contact locations on the first surface thereof;

a first space transformer having a first surface, a second surface, a plurality of first contact locations disposed on the second surface thereof, and a first plurality of elongated resilient electrical conductors mounted adjacent to and extending from the first surface thereof;

wherein the plurality of first contact locations are connected to the plurality of second contact locations of the second space transformer.

CLAIM 229 (Withdrawn) A Probe Assembly, according to claim 228, wherein:

the first plurality of elongated resilient electrical conductors are mounted directly to contact locations on the first surface of the first space transformer.

CLAIM 230 (Withdrawn) A Probe Assembly, according to claim 228, wherein:

the first plurality of elongated resilient electrical conductors are connected to contact locations on the first surface of the first space transformer.

CLAIM 231 (Withdrawn) A Probe Assembly, according to claim 228, wherein:

the first plurality of elongated resilient electrical conductors are composite interconnection elements.

CLAIM 232 (Withdrawn) A Probe Card Assembly, according to claim 228, further comprising:

means for aligning the first space transformer relative to the second space transformer.

CLAIM 233 (Withdrawn) A Probe Assembly, according to claim 232, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 234 (Withdrawn) A Probe Assembly, according to claim 232, wherein the means for aligning the first space transformer comprises:

a plurality of engaging projections and grooves.

CLAIM 235 (Withdrawn) A Probe Assembly, according to claim 228, wherein:

the contact locations are disposed at a first pitch on the second surface of the first space transformer;

the first plurality of elongated resilient electrical conductors each having a second end, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, the second ends are disposed at a second pitch as

determined by the angles corresponding to the first plurality of elongated resilient electrical conductors; and

the first pitch is a shortest distance between any two adjacent contact pads and the second pitch is a shortest distance between any two adjacent elongate electrical conductors.

CLAIM 236 (Withdrawn) A Probe Assembly, comprising:

a second space transformer having a first surface, a second surface and a plurality of second contact locations on the first surface thereof;

a first space transformer having a first surface, a second surface, a plurality of first contact locations disposed on the second surface thereof, and a first plurality of elongated electrical conductors electrically connected adjacent to and extending from the first surface thereof;

wherein the plurality of first contact locations are connected to the plurality of second contact locations of the second substrate.

CLAIM 237 (Withdrawn) A Probe Assembly, according to claim 236, wherein:

the first plurality of elongated electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 238 (Withdrawn) A Probe Assembly, according to claim 236, wherein:

the first plurality of elongated electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 239 (Withdrawn) A Probe Assembly, according to claim 236, wherein:

the first plurality of elongated electrical conductors are composite interconnection elements.

CLAIM 240 (Withdrawn) A Probe Assembly, according to 236, further comprising:

means for aligning the first space transformer relative to the second space transformer.

CLAIM 241 (Withdrawn) A Probe Assembly, according to claim 240, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 242 (Withdrawn) A Probe Assembly, according to claim 240, wherein the means for aligning the first space transformer comprises:

a plurality of engaging projections and grooves.

CLAIM 243 (Withdrawn) A Probe Assembly, according to claim 236, wherein:

the contact locations are disposed at a first pitch on the second surface of the space transformer;

the first plurality of elongated electrical conductors each having a second end, the second end of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, the second ends are disposed at a second pitch as determined by

the angles corresponding to the first and second elongated electrical conductors; and

the first pitch is a shortest distance between any two adjacent contact pads and the second pitch is a shortest distance between any two adjacent elongated electrical conductors.

CLAIM 244 (Withdrawn) A Probe Assembly, according to claim 219, wherein the first pitch is greater than the second pitch.

CLAIM 245 (Withdrawn) A Probe Assembly, according to claim 220, wherein the first pitch is substantially the same as the second pitch.

CLAIM 246 (Withdrawn) A Probe Assembly, according to claim 221, wherein the first pitch is greater than the second pitch.

CLAIM 247 (Withdrawn) A structure, according to claim 225, wherein the first pitch is greater than the second pitch.

CLAIM 248 (Withdrawn) A structure, according to claim 226, wherein the first pitch is substantially the same as the second pitch.

CLAIM 249 (Withdrawn) A structure, according to claim 227, wherein the first pitch is greater than the second pitch.

CLAIM 250 (Withdrawn) A structure comprising:

a substrate having first and second opposed sides with a first set of contact locations on the first side and a second set of contact locations on the second side;

a first set of resilient elongated electrical conductors, each having a first end electrically interconnected to a respective one of the contact locations of the first set of contact locations,

a second end distant from the substrate, and an elongated section extending from the first end to the second end, the elongated section resiliently bending upon depression of the second end towards the substrate, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, wherein the second ends of two adjacent resilient contact structures are spaced as determined by the angles corresponding to the first and second elongated electrical conductors and wherein respective ones of the second set of contact locations are coupled to corresponding ones of the first set of contact locations; and

a second set of elongated electrical conductors, each having a first end electrically interconnected to a respective one of the contact locations of the second set of contact locations, a second end distant from the substrate, and an elongate section extending from the first end to the second end.

CLAIM 251 (Withdrawn) A structure, according to claim 250, further comprising:

an enlargement at ends of the first plurality of resilient elongated electrical conductors.

CLAIM 252 (Withdrawn) A structure, according to claim 250, wherein:

the first plurality of resilient contact structures are composite electrical interconnection elements comprising a first enlargement at the first end, a

second enlargement at the second end and an electrically conductive wire electrically interconnecting the first enlargement and the second enlargement.

CLAIM 253 (Withdrawn) A structure, according to claim 250, wherein:

the first plurality of resilient elongated electrical conductors are fabricated on a sacrificial substrate prior to electrical interconnection of the first plurality of elongated electrical conductors to the first plurality of contact locations.

CLAIM 254 (Withdrawn) A structure, according to claim 250, further comprising:

a subset of the second set of elongated electrical conductors directly electrically interconnected to the second set of contact locations.

CLAIM 255 (Withdrawn) A structure, according to claim 254, wherein:

the second plurality of elongated electrical conductors are composite interconnection elements comprising:

a first enlargement at the first end

a second enlargement at the second end; and

an electrically conductive wire electrically interconnecting the first enlargement and the second enlargement.

CLAIM 256 (Withdrawn) A structure, according to claim 250, wherein:

the second set of elongated electrical conductors are resilient.

CLAIM 257 (Withdrawn) A structure, according to claim 250, wherein:

the second set of elongated electrical conductors are pins.

CLAIM 258 (Withdrawn) A structure, according to claim 250, further including:

a dielectric material disposed on said first surface enveloping a part of said first set of resilient elongated electrical conductors.

CLAIM 259 (Withdrawn) A structure, according to claim 258, wherein:

the second set of elongated electrical conductors are resilient and further including a dielectric material disposed on the second surface and enveloping a part of the second set of elongated electrical conductors.

CLAIM 260 (Withdrawn) A structure, according to claim 251, wherein:

the second plurality of resilient elongated electrical conductors are fabricated on a sacrificial substrate prior to electrically interconnecting the second plurality of resilient elongated electrical conductors to the second plurality of contact locations.

CLAIM 261 (Withdrawn) A Probe Assembly, comprising:

a second space transformer having a first surface, a second surface and a first plurality of contact locations on the first surface thereof;

an interconnection structure having a first surface, a second surface, a second plurality of electrical conductors extending from the second surface thereof and a first plurality of electrical conductors extending from the first surface thereof; and

a first space transformer having a first surface, a second surface, a plurality of contact locations disposed on the second surface thereof, and a third plurality of elongated resilient electrical conductors extending from the first surface thereof; wherein:

the second plurality of electrical conductors effect a pressure connection with the contact locations of the second space transformer; and

the first plurality of electrical conductors effect a pressure connection with the contact locations of the first space transformer.

CLAIM 262 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

the interconnection structure comprises a dielectric material comprising a plurality of elongated electrical conductors embedded therein;

a plurality of first ends of which comprise the first plurality of electrical conductors and a plurality of second ends of which comprise the second plurality of electrical conductors.

CLAIM 263 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

the second plurality of electrical conductors are pins.

CLAIM 264 (Withdrawn) A structure, according to claim 261, further including:

a dielectric material disposed on said first surface of the interconnecting structure enveloping a part of said first set of resilient elongated electrical conductors.

CLAIM 265 (Withdrawn) A Probe Assembly, according to claim 264, wherein:

the first set of electrical conductors are elongated and resilient and further including a dielectric material disposed on the first surface and enveloping a part of the first set of elongated electrical conductors.

CLAIM 266 (Withdrawn) A Probe Assembly, according to claim 262, wherein:

the third plurality of elongated resilient electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 267 (Withdrawn) A Probe Assembly, according to claim 261, further including:

a dielectric material disposed on the first surface of the space transformer enveloping a part of the third plurality of elongated resilient electrical conductors.

CLAIM 268 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

the first plurality of electrical conductors are composite elongated resilient electrical interconnection elements comprising:

a first enlargement at a first end thereof, a second enlargement at a second end thereof; and

a wire interconnecting the first enlargement and the second enlargement.

CLAIM 269 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

the second plurality of electrical conductors are composite elongated resilient electrical interconnection elements comprising:

a first enlargement at a first end thereof, a second enlargement at a second end thereof; and

a wire interconnecting the first enlargement and the second enlargement.

CLAIM 270 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

the third plurality of elongated resilient electrical conductors are composite electrical interconnection elements comprising:

a first enlargement at a first end thereof, a second enlargement at a second end thereof; and

a wire interconnecting the first enlargement and the second enlargement.

CLAIM 271 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

one or more of the first plurality of electrical conductors are an elongated resilient composite structure comprising an elongated element and a coating.

CLAIM 272 (Withdrawn) A Probe Assembly, according to claim 261, wherein:

one or more of the second plurality of electrical conductors are an elongated resilient composite structure comprising an elongated element and a coating.

CLAIM 273 (Withdrawn) A structure, according to claim 261, further comprising:

a clamp for holding the first space transformer in place with respect to said second space transformer,

the clamp comprises a sheet of material supported by a member
perpendicularly disposed with respect to the second space transformer;

means for affixing the sheet to the member; and

means for urging the first space transformer towards the first surface of
the second space transformer.

CLAIM 274 (Withdrawn) A Probe Assembly, according to claim 273, wherein said
clamps comprises a sheet made of aluminum.

CLAIM 275 (Withdrawn) A Probe Assembly, according to claim 273, wherein the means
for urging the first space transformer comprises:

the sheet of material; and

a screw holding the sheet in place with respect to the member and the
second space transformer with the first space transformer captured
therebetween.

CLAIM 276 (Withdrawn) A Probe Assembly, according to claim 275, wherein:

said sheet comprises aluminum.

CLAIM 277 (Withdrawn) A Probe Assembly, according to claim 275, further comprising:

a member perpendicularly disposed with respect to the second space
transformer for supporting the sheet of material.

CLAIM 278 (Withdrawn) A Probe Assembly, according to claim 275, wherein the clamp
comprises means for affixing a sheet of material supported by a member

perpendicularly disposed with respect to the second space transformer, the sheet is held in place to the member by a screw forming the clamp to hold the first space transformer in place with respect to the second space transformer.

CLAIM 279 (Withdrawn) A Probe Assembly, according to claim 275, wherein:
the sheet and the member are made of aluminum.

CLAIM 280 (Withdrawn) A Probe Assembly, according to 261, further comprising:

means for aligning of the first space transformer relative to the second space transformer.

CLAIM 281 (Withdrawn) A Probe Assembly, according to claim 280, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 282 (Withdrawn) A Probe Assembly, according to claim 280, wherein the means for aligning the first space transformer comprises:

a plurality of projections for mating with grooves on the interconnection structure.

CLAIM 283 (Withdrawn) A Probe Assembly, according to claim 261, wherein:
the contact locations are disposed at a first pitch on the second surface of the second space transformer;

the third plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the second space transformer.

CLAIM 284 (Withdrawn) A Probe Assembly, according to claim 283, wherein:
the first pitch is greater than the second pitch.

CLAIM 285 (Withdrawn) A Probe Assembly, according to claim 261, wherein:
the first plurality of elongated resilient electrical conductors are disposed
at a first pitch on the first surface of the interconnection structure;

the second plurality of elongated resilient electrical conductors are
disposed at a second pitch on the second surface of the interconnection
structure.

CLAIM 286 (Withdrawn) A Probe Assembly, according to claim 261, wherein:
the contact locations are disposed at a first pitch on the second surface of
the first space transformer;

the third plurality of elongated resilient electrical conductors are disposed
at a second pitch on the first surface of the second space transformer;

the first plurality of elongated resilient electrical conductors are disposed
at the first pitch on the first surface of the interconnection structure;

the second plurality of elongated resilient electrical conductors are
disposed at the first pitch on the second surface of the interconnection
structure.

CLAIM 287 (Withdrawn) A Probe Assembly, according to claim 286, wherein the first
pitch is greater than the second pitch.

CLAIM 288 (Withdrawn) A Probe Assembly, according to claim 261, wherein at least
some of the elongated resilient electrical conductors comprise:

a composite interconnection element having an end; and

a protuberance disposed at the end of the composite interconnection element.

CLAIM 289 (Withdrawn) A structure, according to claim 261, wherein:

the third plurality of elongated resilient electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 290 (Withdrawn) A structure, comprising:

a first space transformer having a first surface, a second surface, a plurality of contact locations disposed on the second surface thereof, and a plurality of elongated electrical conductors connected to the first surface thereof, said first space transformer adapted in use such that ends of the plurality of elongated electrical conductors for making pressure contacts with a corresponding plurality of contact locations on a semiconductor wafer; and

an interconnection structure having a first surface, a second surface, a first plurality of electrical conductors extending from the first surface thereof, said electrical interconnection structure adapted in use such that contact regions of the first plurality of electrical conductors make pressure connections with the plurality of contact locations on the second surface of the first space transformer, the electrical interconnection structure having a second plurality of electrical conductors extending from the second surface thereof, said interconnection structure adapted in use for contact locations of the second plurality of electrical conductors making pressure

connections with a plurality of contact locations on a second space transformer.

CLAIM 291 (Withdrawn) A structure, according to claim 290, wherein:

said interconnection structure comprises a dielectric material comprising a plurality of elongated electrical conductors embedded therein, a plurality of first ends of which comprise the first plurality of electrical conductors and a plurality of second ends of which comprise the second plurality of electrical conductors.

CLAIM 292 (Withdrawn) A structure, according to claim 290, wherein:

the contact locations are disposed at a first pitch on the second surface of the first space transformer;

the plurality of elongated electrical conductors are disposed at a second pitch on the first surface of the first space transformer.

CLAIM 293 (Withdrawn) A structure, according to claim 292, wherein said first pitch is greater than said second pitch.

CLAIM 294 (Withdrawn) A structure, according to claim 290, wherein:

the second plurality of elongated resilient electrical conductors are disposed at a first pitch on the second surface of the interconnection structure;

the first plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the interconnection structure.

CLAIM 295 (Withdrawn) A structure according to claim 294, wherein the first pitch is substantially the same as the second pitch.

CLAIM 296 (Withdrawn) A structure, according to claim 290, wherein:

the contact locations are disposed at a first pitch on the second surface of the space transformer;

the plurality of elongated resilient electrical conductors are disposed at a second pitch on the first surface of the space transformer;

the second plurality of elongated resilient electrical conductors are disposed at the first pitch on the second surface of the electrical interconnection structure;

the first plurality of elongated resilient electrical conductors are disposed at the first pitch on the first surface of the electrical interconnection structure.

CLAIM 297 (Withdrawn) A structure according to claim 296, wherein the first pitch is greater than the second pitch.

CLAIM 298 (Withdrawn) A Probe Card Assembly, comprising:

a second space transformer having a first surface, a second surface and a plurality of second contact locations on the first surface thereof;

a first space transformer having a first surface, a second surface, a plurality of first contact locations disposed on the second surface thereof, and a first plurality of elongated resilient electrical conductors mounted adjacent to and extending from the first surface thereof;

wherein the plurality of first contact locations are connected to the plurality of second contact locations of the second space transformer.

CLAIM 299 (Withdrawn) A Probe Card Assembly, according to claim 298, wherein:

the first plurality of elongated resilient electrical conductors are mounted directly to contact locations on the first surface of the first space transformer.

CLAIM 300 (Withdrawn) A Probe Card Assembly, according to claim 298, wherein:

the first plurality of elongated resilient electrical conductors are connected to contact locations on the first surface of the first space transformer.

CLAIM 301 (Withdrawn) A Probe Card Assembly, according to claim 298, wherein:

the first plurality of elongated resilient electrical conductors are composite interconnection elements.

CLAIM 302 (Withdrawn) A Probe Card Assembly, according to claim 298, further comprising:

means for aligning the first space transformer relative to the second space transformer.

CLAIM 303 (Withdrawn) A Probe Card Assembly, according to claim 302, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 304 (Withdrawn) A Probe Card Assembly, according to claim 302, wherein the means for aligning the first space transformer comprises:

a plurality of engaging projections and grooves.

CLAIM 305 (Withdrawn) A Probe Card Assembly, according to claim 298, wherein:

the contact locations are disposed at a first pitch on the second surface of the first space transformer;

the first plurality of elongated resilient electrical conductors each having a second end, the second ends of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, the second ends are disposed at a second pitch as determined by the angles corresponding to the first plurality of elongated resilient electrical conductors; and

the first pitch is a shortest distance between any two adjacent contact pads and the second pitch is a shortest distance between any two adjacent elongate electrical conductors.

CLAIM 306 (Withdrawn) A Probe Card Assembly, comprising:

a second space transformer having a first surface, a second surface and a plurality of second contact locations on the first surface thereof;

a first space transformer having a first surface, a second surface, a plurality of first contact locations disposed on the second surface thereof, and a first plurality of elongated electrical conductors electrically connected adjacent to and extending from the first surface thereof;

wherein the plurality of first contact locations are connected to the plurality of second contact locations of the second substrate.

CLAIM 307 (Withdrawn) A Probe Card Assembly, according to claim 306, wherein:

the first plurality of elongated electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 308 (Withdrawn) A Probe Card Assembly, according to claim 306, wherein:

the first plurality of elongated electrical conductors are electrically interconnected to contact locations on the first surface of the first space transformer.

CLAIM 309 (Withdrawn) A Probe Card Assembly, according to claim 306, wherein:

the first plurality of elongated electrical conductors are composite interconnection elements.

CLAIM 310 (Withdrawn) A Probe Card Assembly, according to 306, further comprising:

means for aligning the first space transformer relative to the second space transformer.

CLAIM 311 (Withdrawn) A Probe Card Assembly, according to claim 310, wherein the means for aligning the first space transformer comprises:

a plurality of pins disposed on the first space transformer.

CLAIM 312 (Withdrawn) A Probe Card Assembly, according to claim 310, wherein the means for aligning the first space transformer comprises:

a plurality of engaging projections and grooves.

CLAIM 313 (Withdrawn) A Probe Card Assembly, according to claim 306, wherein:

the contact locations are disposed at a first pitch on the second surface of the space transformer;

the first plurality of elongated electrical conductors each having a second end, the second end of the elongated electrical conductors are at an angle with respect to the first end of the elongated electrical conductor and the contact location, the angle being between a minimum and a maximum value, the second ends are disposed at a second pitch as determined by the angles corresponding to the first and second elongated electrical conductors; and

the first pitch is a shortest distance between any two adjacent contact pads and the second pitch is a shortest distance between any two adjacent elongated electrical conductors.

CLAIM 314 (Withdrawn) A Probe Assembly, according to claim 285, wherein the first pitch is substantially the same as the second pitch.

CLAIM 315 (Withdrawn) A Probe Assembly, according to claim 202, wherein:

the interconnection structure comprises a dielectric material comprising a plurality of elongated electrical conductors embedded therein:

a plurality of first ends of which comprise the first plurality of elongated resilient electrical conductors and a plurality of second ends of which comprise the second plurality of elongated resilient electrical conductors.

CLAIM 316 (Withdrawn) A structure, according to claim 291, wherein the plurality of first ends comprise a first plurality of elongated resilient electrical conductors and the plurality of second ends comprise a second plurality of elongated resilient electrical conductors.

CLAIM 317 (Withdrawn) A structure, according to claim 262, wherein the plurality of first ends comprise a first plurality of elongated resilient electrical conductors and the plurality of second ends comprise a second plurality of elongated resilient electrical conductors.

CLAIM 318 (Withdrawn) A space transformer comprising:

a first substrate provided with first electrical contact locations on one side thereof;

first elongated electrical conductors, each having an elongate flexible shape and a respective first end connected to a respective first electrical contact location of said first electrical contact locations, and extending from the respective first electrical contact location;

a second substrate provided with second electrical contact locations on one side thereof and third electrical contact locations on an opposite side thereof;

the second contact locations facing the first contact locations and each first elongated electrical conductor having a respective second end

connected to a respective one of the second electrical contact locations, the second substrate being disassembleable from the first substrate; and

second elongated electrical conductors, each having an elongate flexible shape and a respective first end connected to a respective third electrical contact location of said third electrical contact locations and extending from the respective third electrical contact location,

selected ones of the first elongated electrical conductors are interconnected with selected ones of the second contact locations, and

selected ones of the first contact locations are spaced from one another by first distances, and selected ones of the second elongated electrical conductors have second ends, remotely located from the first ends thereof, which are spaced from one another by second distances.

CLAIM 319 (Withdrawn) A space transformer, according to claim 318, wherein:

the first substrate is a printed circuit board.

CLAIM 320 (Withdrawn) A space transformer, according to claim 318, wherein:

selected ones of the second electrical contact locations and selected ones of the third electrical contact locations are electrically interconnected by electrically conductive vias.

CLAIM 321 (Withdrawn) A space transformer, according to claim 318, wherein selected ones of the first flexible elongated electrical conductors comprise:

a flexible elongate core element having a first end and a second end and formed of a readily-shaped material;

an electrically conductive coating, formed of a layer of conductive material disposed on the elongate core element.

CLAIM 322 (Withdrawn) A space transformer, according to claim 321, wherein:

the flexible elongate core element is selected from the group consisting of:

palladium, gold alloy, copper alloy, gold, aluminum, copper, silver, nickel and combinations thereof.

CLAIM 323 (Withdrawn) space transformer, according to claim 321, wherein:

the flexible elongate core element has a diameter in the range of from 1 to 5 mils.

CLAIM 324 (Withdrawn) A space transformer, according to claim 323, wherein:

the flexible elongate core element is a wire.

CLAIM 325 (Withdrawn) A space transformer, according to claim 321, wherein:

the flexible elongate core element has a length of about 40 mils.

CLAIM 326 (Withdrawn) A space transformer, according to claim 321, wherein:

the electrically conductive coating comprising a material selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 327 (Withdrawn) A space transformer, according to claim 321, wherein:

the electrically conductive coating comprises nickel and cobalt.

CLAIM 328 (Withdrawn) A space transformer, according to claim 321, wherein:

the electrically conductive coating comprises a coating selected from the group consisting of nickel, cobalt, chromium, gold and palladium.

CLAIM 329 (Withdrawn) A space transformer, according to claim 321, wherein:

the electrically conductive coating is formed of a material selected from nickel, cobalt, chromium and gold.

CLAIM 330 (Withdrawn) A space transformer, according to claim 321, wherein:

the electrically conductive coating is a coating selected from the group consisting of an electroplated coating, an electrolessly plated coating, a sputtered coating and an e-beam evaporated coating.

CLAIM 331 (Withdrawn) A space transformer, according to claim 330, wherein:

the electrically conductive coating is a thin layer.

CLAIM 332 (Withdrawn) A space transformer, according to claim 318, wherein:

the substrate is a multi-layer interconnection substrate.

CLAIM 333 (Withdrawn) A space transformer, according to claim 318, wherein:

the first substrate comprises a dielectric material comprising a plurality of elongated electrical conductors embedded therein; and

a plurality of first ends of which comprise the first plurality of electrical conductors.

CLAIM 334 (Withdrawn) A space transformer comprising:

a first substrate comprising on one side thereof first elongated electrical conductors, each having an elongate flexible shape and a respective first end disposed at the one side thereof, and extending therefrom;

a second substrate provided with second electrical contact locations on one side thereof and third electrical contact locations on an opposite side thereof;

the second contact locations facing the first contact locations and each first elongated electrical conductor having a respective second end connected to a respective one of the second electrical contact locations, the second substrate being disassembleable from the first substrate; and

second elongated electrical conductors, each having an elongate flexible shape and a respective first end connected to a respective third electrical contact location of said third electrical contact locations and extending from the respective third electrical contact location,

selected ones of the first elongated electrical conductors are interconnected with selected ones of the second contact locations, and

selected ones of the first contact locations are spaced from one another by first distances, and selected ones of the second elongated electrical

conductors have second ends, remotely located from the first ends thereof, which are spaced from one another by second distances.

CLAIM 335 (Withdrawn) A space transformer, according to claim 318, wherein the second distance is different than the first distance.

CLAIM 336 (Withdrawn) A space transformer, according to claim 318, wherein the second substrate is a printed circuit card.

CLAIM 337 (Withdrawn) A space transformer, according to claim 336, wherein:

the first substrate comprises a dielectric material comprising a plurality of elongated electrical conductors embedded therein;

a plurality of first ends of which comprise the first plurality of electrical conductors.

CLAIM 338 (Withdrawn) A space transformer, according to claim 334, wherein:

the first substrate is a printed circuit board.

CLAIM 339 (Withdrawn) A space transformer, according to claim 334, wherein:

selected ones of the second electrical contact locations and selected ones of the third electrical contact locations are electrically interconnected by electrically conductive vias.

CLAIM 340 (Withdrawn) A space transformer, according to claim 335, wherein selected ones of the first flexible elongated electrical conductors comprise:

a flexible elongate core element having a first end and a second end and formed of a readily-shaped material;

an electrically conductive coating, formed of a layer of conductive material disposed on the elongate core element.

CLAIM 341 (Withdrawn) A space transformer, according to claim 340, wherein:

the flexible elongate core element is selected from the group consisting of:

palladium, gold alloy, copper alloy, gold, aluminum, copper, silver, nickel and combinations thereof.

CLAIM 342 (Withdrawn) A space transformer, according to claim 340, wherein:

the flexible elongate core element has a diameter in the range of from 1 to 5 mils.

CLAIM 343 (Withdrawn) A space transformer, according to claim 342, wherein:

the flexible elongate core element is a wire.

CLAIM 344 (Withdrawn) A space transformer, according to claim 339, wherein:

the flexible elongate core element has a length of about 40 mils.

CLAIM 345 (Withdrawn) A space transformer, according to claim 340, wherein:

the electrically conductive coating comprising a material selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 346 (Withdrawn) A space transformer, according to claim 340, wherein:

the electrically conductive coating comprises nickel and cobalt.

CLAIM 347 (Withdrawn) A space transformer, according to claim 340, wherein:

the electrically conductive coating comprises a coating selected from the group consisting of nickel, cobalt, chromium, gold and palladium.

CLAIM 348 (Withdrawn) A space transformer, according to claim 340, wherein:

the electrically conductive coating is formed of a material selected from nickel, cobalt, chromium and gold.

CLAIM 349 (Withdrawn) A space transformer, according to claim 340, wherein:

the electrically conductive coating is a coating selected from the group consisting of an electroplated coating, an electrolessly plated coating, a sputtered coating and an e-beam evaporated coating.

CLAIM 350 (Withdrawn) A space transformer, according to claim 349, wherein:

the electrically conductive coating is a thin layer.

CLAIM 351 (Withdrawn) A space transformer, according to claim 335, wherein:

the substrate is a multi-layer interconnection substrate.

CLAIM 352 (Withdrawn) A space transformer, according to claim 334, wherein:

the first distance is different than the second distance.

CLAIM 353 (Withdrawn) A space transformer, according to claim 334, wherein:

the second substrate is a printed circuit card.

CLAIM 354 (Withdrawn) A structure comprising:

a first substrate comprising a surface and a plurality of first elongated flexible electrical conductors extending from locations at the surface;

a second substrate comprising first electrical contact locations on one side thereof and second contact locations on an opposite side thereof;

the first contact location facing the surface of the first substrate, and each first elongated flexible electrical conductor of the first substrate have an end electrically connected to a first contact location, the second substrate being disassembleable from the first substrate, and second elongated flexible conductors having a first end electrically connected to a second contact location and extending away therefrom;

selected ones of the first elongated electrical conductors are electrically interconnected with selected ones of the first contact locations;

the first contact locations are spaced apart from one another by a first distance, the second contact locations are spaced apart from one another by a second distance.

CLAIM 355 (Withdrawn) A structure, according to claim 354, wherein:

the second distance is different than the first distance.

CLAIM 356 (Withdrawn) A structure, according to claim 354, wherein:

the second substrate is a printed circuit card.

CLAIM 357 (Withdrawn) A structure, according to claim 354, wherein:

the first substrate comprises a dielectric material comprising the first plurality of elongated electrical conductors embedded therein;

a plurality of first ends of which comprise the first plurality of electrical conductors.

CLAIM 358 (Withdrawn) A structure, according to claim 354, wherein:

the first substrate is a printed circuit board.

CLAIM 359 (Withdrawn) A structure, according to claim 354, wherein:

selected ones of the first electrical contact locations and selected ones of the second electrical contact locations are electrically interconnected by electrically conductive vias.

CLAIM 360 (Withdrawn) A structure, according to claim 354, wherein selected ones of the first flexible elongated electrical conductors comprise:

a flexible elongate core element having a first end and a second end and formed of a readily-shaped material;

an electrically conductive coating, formed of a layer of conductive material disposed on the elongate core element.

CLAIM 361 (Withdrawn) A structure, according to claim 360, wherein:

the flexible elongate core element is selected from the group consisting of:

palladium, gold alloy, copper alloy, gold, aluminum, copper, silver, nickel
and combinations thereof.

CLAIM 362 (Withdrawn) A structure, according to claim 360, wherein:

the flexible elongate core element has a diameter in the range of from 1 to
5 mils.

CLAIM 363 (Withdrawn) A structure, according to claim 362, wherein:

the flexible elongate core element is a wire.

CLAIM 364 (Withdrawn) A structure, according to claim 360, wherein:

the flexible elongate core element has a length of about 40 mils.

CLAIM 365 (Withdrawn) A structure, according to claim 360, wherein:

the electrically conductive coating comprising a material selected from the
group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 366 (Withdrawn) A structure, according to claim 360, wherein:

the electrically conductive coating comprises nickel and cobalt.

CLAIM 367 (Withdrawn) A structure, according to claim 360, wherein:

the electrically conductive coating comprises a coating selected from the group consisting of nickel, cobalt, chromium, gold and palladium.

CLAIM 368 (Withdrawn) A structure, according to claim 360, wherein:

the electrically conductive coating is formed of a material selected from nickel, cobalt, chromium and gold.

CLAIM 369 (Withdrawn) A structure, according to claim 360, wherein:

the electrically conductive coating is a coating selected from the group consisting of an electroplated coating, an electrolessly plated coating, a sputtered coating and an e-beam evaporated coating.

CLAIM 370 (Withdrawn) A structure, according to claim 369, wherein:

the electrically conductive coating is a thin layer.

CLAIM 371 (Withdrawn) A structure, according to claim 355, wherein:

the second substrate is a multi-layer interconnection substrate.

CLAIM 372 (Withdrawn) A structure, according to claim 355, wherein:

the elongated electrical conductor extending from the locations of the surface of the first substrate comprises a wire.

CLAIM 373 (Withdrawn) A structure comprising:

a first substrate comprising first electrical contact locations and a plurality of first elongated flexible electrical conductors extending from the first electrical contact locations;

a second substrate comprising second electrical contact locations on one side thereof and third contact locations on an opposite side thereof;

the second contact location facing the first contact locations, and each first elongated flexible electrical conductor comprises an end electrically connected to a first contact location, the second substrate being disassembleable from the first substrate, and second elongated flexible conductors having a first end electrically connected to a second contact location and extending away therefrom;

selected ones of the first elongated electrical conductors are electrically interconnected with selected ones of the second contact locations;

the first contact locations are spaced apart from one another by a first distance, the second contact locations are spaced apart from one another by a second distance.

CLAIM 374 (Withdrawn) A structure, according to claim 373, wherein:

the second distance is different than the first distance.

CLAIM 375 (Withdrawn) A structure, according to claim 373, wherein:

the second substrate comprises a printed circuit card.

CLAIM 376 (Withdrawn) A structure, according to claim 373, wherein:

selected elements of the first and second plurality of elongated electrical conductors are embedded in a dielectric material.

CLAIM 377 (Withdrawn) A structure, according to claim 373, wherein:

the first substrate is a printed circuit board.

CLAIM 378 (Withdrawn) A structure, according to claim 373, wherein:

selected ones of the second electrical contact locations and selected ones of the third electrical contact locations are electrically interconnected by electrically conductive vias.

CLAIM 379 (Withdrawn) A structure, according to claim 373, wherein an element selected from the group consisting of selected ones of the first and second flexible elongated electrical conductors comprise:

a flexible elongate core element having a first end and a second end and formed of a readily-shaped material;

an electrically conductive coating, formed of a layer of conductive material disposed on the elongate core element.

CLAIM 380 (Withdrawn) A structure, according to claim 379, wherein:

the flexible elongate core element is selected from the group consisting of:

palladium, gold alloy, copper alloy, gold, aluminum, copper, silver, nickel and combinations thereof.

CLAIM 381 (Withdrawn) A structure, according to claim 379, wherein:
the flexible elongate core element has a diameter in the range of from 1 to 5 mils.

CLAIM 382 (Withdrawn) A structure, according to claim 381, wherein:
the flexible elongate core element is a wire.

CLAIM 383 (Withdrawn) A structure, according to claim 379, wherein:
the flexible elongate core element has a length of about 40 mils.

CLAIM 384 (Withdrawn) A structure, according to claim 379, wherein:
the electrically conductive coating comprising a material selected from the group consisting of Au, Cr, Co, Ni and Pd.

CLAIM 385 (Withdrawn) A structure, according to claim 379, wherein:
the electrically conductive coating comprises nickel and cobalt.

CLAIM 386 (Withdrawn) A structure, according to claim 379, wherein:
the electrically conductive coating comprises a coating selected from the group consisting of nickel, cobalt, chromium, gold and palladium.

CLAIM 387 (Withdrawn) A structure, according to claim 379, wherein:
the electrically conductive coating is formed of a material selected from nickel, cobalt, chromium and gold.

CLAIM 388 (Withdrawn) A structure, according to claim 379, wherein:

the electrically conductive coating is a coating selected from the group consisting of an electroplated coating, an electrolessly plated coating, a sputtered coating and an e-beam evaporated coating.

CLAIM 389 (Withdrawn) A structure, according to claim 388, wherein:

the electrically conductive coating is a thin layer.

CLAIM 390 (Withdrawn) A structure, according to claim 373, wherein:

an element selected from the group consisting of the first and the second substrate is a multi-layer interconnection substrate.

CLAIM 391 (Withdrawn) A structure, according to claim 373, wherein:

the second substrate comprises a fan out substrate.

CLAIM 392 (Withdrawn) A structure, according to claim 373, wherein:

the first and second elongated electrical conductors are embedded in a dielectric layer and the second substrate is a fan out substrate.

CLAIM 393 (Withdrawn) A structure, according to claim 392, wherein:

the first elongated electrical conductors embedded in the dielectric layer comprise an interposer disposed between the first and second substrate to provide electrical connection between selected ones of the first electrical contact locations and selected ones of the second electrical contact location through selected ones of the first elongated electrical conductors.